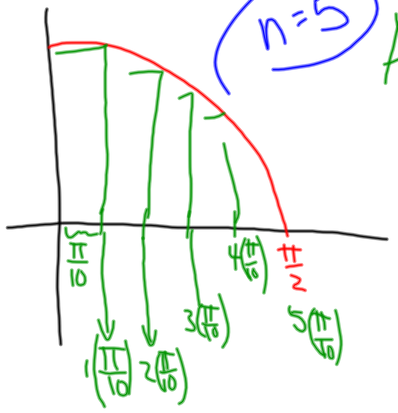
6.1/4 $f(x)=\cos x$; $[0,\frac{\pi}{2}]$

$n=5$



$$A=\left(\frac{\pi}{2\cdot 5}\right)\left(\cos\left(1\frac{\pi}{2\cdot 5}\right)\right)+\left(\frac{\pi}{2\cdot 5}\right)\left(\cos\left(2\frac{\pi}{2\cdot 5}\right)\right)+\left(\frac{\pi}{2\cdot 5}\right)\left(\cos\left(3\frac{\pi}{2\cdot 5}\right)\right)+\left(\frac{\pi}{2\cdot 5}\right)\left(\cos\left(4\frac{\pi}{2\cdot 5}\right)\right)+\left(\frac{\pi}{2\cdot 5}\right)\left(\cos\left(5\frac{\pi}{2\cdot 5}\right)\right)$$

$$\sum_{K=1}^{5}\left(\frac{\pi}{10}\right)\left(\cos\left(\frac{K\pi}{10}\right)\right)$$

Sum(seq((π/10)(cos(Xπ/10)),X,1,5))

$$\sum_{K=1}^{N}\left(\frac{\pi}{2N}\right)\left(\cos\left(\frac{K\pi}{2N}\right)\right)$$

turn on calculator → type 20 enter

20

$\boxed{\text{STO}\rightarrow}$ $\boxed{\text{ALPHA+N}}$ enter

SUM(SEQ(π/(2N)*COS(Xπ/(2N)),X,1,N)

100 enter

100

$\boxed{\text{STO}\rightarrow}$ N enter

100

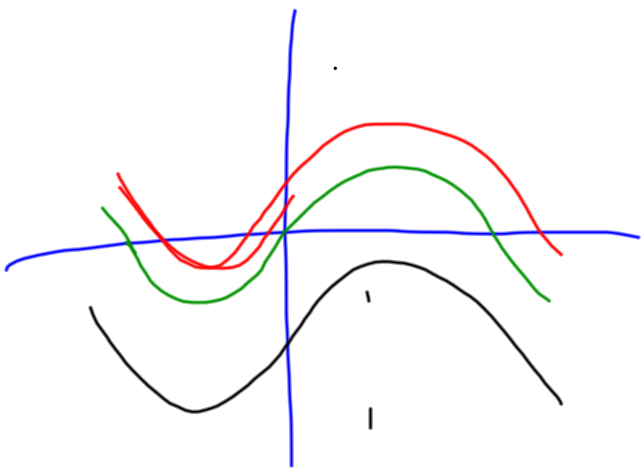
2ND entry 2ND entry 2ND entry enter

$$\int f(x)\,dx \equiv \text{the anti-derivative of } f(x)$$

$$\Rightarrow \frac{d}{dx}\left[\int f(x)\,dx\right] = f(x)$$

$$\int \cos x \, dx = \sin x + C$$

$$\int \sin x \, dx = -\cos x + C$$



$\frac{d}{dx}\left(x^n\right)$

① multiply by exponent

② subtract 1 from exponent

$\int x^n \, dx$

① add 1 to exponent

② divide by new exponent

$$\frac{x^{n+1}}{n+1} + C$$

$$\int x^1 dx = \frac{x^2}{2} + C$$

$$\int x^2 dx = \frac{x^3}{3} + C$$

$$\int \frac{1}{x^2} dx = \int x^{-2} dx = \frac{x^{-1}}{-1} + C$$

$$= -\frac{1}{x} + C$$

$$\int \frac{1}{x}\,dx = \int x^{-1}\,dx = \frac{x^0}{0}$$

$$\frac{d}{dx}(\ln x) = \frac{1}{x}$$

$$\int \frac{1}{x}\,dx = \ln x + C$$

$$\lim_{x\to ?} c f(x) = c \lim_{x\to ?} f(x)$$

$2 \quad x \qquad 2 \cdot 1$

$$\frac{d}{dx}\left(c f(x)\right) = c \frac{d}{dx}\left(f(x)\right)$$

$$\int c f(x)\, dx = c \int f(x)\, dx$$

$$\lim_{x \to ?} \left(f(x) \pm g(x) \right) = \lim_{x \to ?} f(x) \pm \lim_{x \to ?} g(x)$$

$$\frac{d}{dx}\left(f(x) \pm g(x) \right) = \frac{d}{dx}\left(f(x)\right) \pm \frac{d}{dx}\left(g(x)\right)$$

$$\int f(x) \pm g(x)\, dx = \int f(x)\, dx \pm \int g(x)\, dx$$

$$\lim_{x\to ?} f(x)\cdot g(x) = \left[\lim_{x\to ?} f(x)\right]\left[\lim_{x\to ?} g(x)\right]$$

if lim f & lim g exist

$$\frac{d}{dx}\left(f(x)\cdot g(x)\right) = \text{product rule}$$

$$\int f(x)\cdot g(x)\,dx = \text{NOT able to be done}$$

(unless integration by parts or substitution works)

6.2.3-31

6.2/
three through
thirty-one

6.2 Antiderivatives

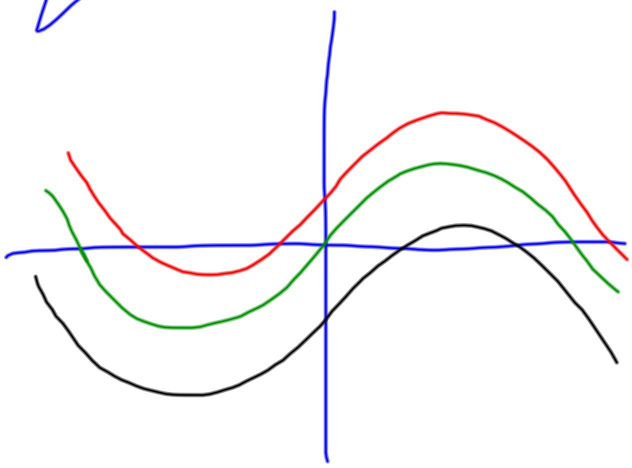
$$\int f(x)\,dx \equiv \text{the anti-derivative of } f(x)$$

(i.e. the function whose derivative is $f(x)$)

$\int f(x)\,dx$

integral $\equiv$ "indefinite" integral

$$\int \cos x \, dx = \sin x + C$$



$$\int \sin x \, dx = -\cos x + C$$

$\frac{d}{dx}(x^n)$

1) multiply by exponent

2) subtract 1 from exponent

nx^{n-1}

$\int x^n dx = \frac{x^{n+1}}{n+1} + C$

1) add 1 to exponent

2) divide by new exponent

$$\int x^1 dx = \frac{x^2}{2} + C$$

$$\int x^2 dx = \frac{x^3}{3} + C$$

$$\int \frac{1}{x^2} dx = \int x^{-2} dx = \frac{x^{-1}}{-1} + C$$

$$= -\frac{1}{x} + C$$

$$\int \frac{1}{x}dx = \int x^{-1}dx = \frac{x^0}{0} \cancel{x}$$

$$\frac{d}{dx}(\ln x) = \frac{1}{x}$$

$$\therefore \int \frac{1}{x}dx = \ln x + C$$

$$\lim_{x \to ?} c f(x) = c \lim_{x \to ?} f(x)$$

$$\frac{d}{dx}\left(c f(x)\right) = c \frac{d}{dx}\left(f(x)\right)$$

$$\int c f(x)\, dx = c \int f(x)\, dx$$

$$\lim_{x \to ?} \left[f(x) \pm g(x) \right] = \lim_{x \to ?} f(x) \pm \lim_{x \to ?} g(x)$$

$$\frac{d}{dx}\left(f(x) \pm g(x) \right) = \frac{d}{dx}\left(f(x) \right) \pm \frac{d}{dx}\left(g(x) \right)$$

$$\int f(x) \pm g(x)\, dx = \int f(x)\, dx \pm \int g(x)\, dx$$

$$\lim_{x\to ?} f(x)\cdot g(x) = \left[\lim_{x\to ?} f(x)\right]\left[\lim_{x\to ?} g(x)\right]$$

if both exist

$$\frac{d}{dx}\left(f(x)\cdot g(x)\right) \Rightarrow \text{PRODUCT RULE}$$

$$\int f(x)\cdot g(x)\,dx = \text{CAN'T be done}$$

[unless integration by parts or substitution works]